

What is claimed is:

1. A method for heating glass panels in a tempering furnace equipped with rollers, the method comprising:

5 carrying glass panels on a conveyor, the conveyor being at least partially formed by rollers, into a tempering furnace for a heating cycle;

after the heating cycle, carrying the glass panels into a tempering furnace;

10 heating the glass panels in the tempering furnace using bottom- and top-heating radiation elements as well as heating the glass panels in the tempering furnace using bottom- and top-heating convection elements with convection air supplied into the tempering furnace, wherein the bottom-heating convection elements are disposed lengthwise of the tempering furnace and define convection heating zones side-by-side in a lateral direction of the tempering furnace.

15 2. The method as set forth in claim 1, wherein the bottom-heating convection elements are adapted to provide a bottom-heating convection effect and are controlled so that heating effects in the convection heating zones are altered relative to each other.

20 3. The method as set forth in claim 2, wherein the top-heating convection elements are disposed lengthwise of the tempering furnace and define top convection heating zones side-by-side in a lateral direction of the tempering furnace and the top-heating convection elements are adapted to provide a top-heating convection effect and are controlled so that heating effects in the top convection heating zones and in top sides of the glass panels are altered relative to each other.

25 4. The method as set forth in claim 3, wherein the bottom-heating convection elements and the top-heating convection elements are controlled so that bottom- and top-heating convection effects substantially follow each other.

30 5. The method as set forth in claim 2, wherein the bottom-heating convection elements are controlled to alter bottom-heating convection effects in the convection heating zones relative to each other by controlling at least one of volume flow, temperature, and jet duration of convection air.

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6. The method as set forth in claim 5, wherein the bottom-heating convection elements are controlled so that jet duration of convection air is shorter at edge zones of the glass panels than at mid-sections of the glass panels.

7. The method as set forth in claim 2, wherein the bottom-heating convection elements are controlled to alter bottom-heating convection effects in the convection heating zones relative to each other by controlling flow of convection air to the bottom-heating convection elements.

8. The method as set forth in claim 2, wherein the bottom-heating convection elements are controlled to alter bottom-heating convection effects in the convection heating zones relative to each other by switching on and off flow of convection air to the bottom-heating convection elements.

9. The method as set forth in claim 2, wherein the top-heating convection elements are adapted to provide a top-heating convection effect and are controlled so that heating effects in the top convection heating zones and in top sides of the glass panels are altered relative to each other, and wherein bottom-heating convection effects and top-heating convection effects are varied during a heating cycle for a glass panel such that, during one stage of a heating cycle for the glass panel, convection heating at a top side of the glass panel is more intense than convection heating at a bottom side of the glass panel and, during a subsequent stage of the heating cycle, convection heating at the bottom side of the glass panel is more intense than convection heating at the top side of the glass panel.

10. The method as set forth in claim 3, further comprising measuring temperatures of the top-heating radiation elements, comparing measured temperatures with a set value, and increasing power to ones of the radiation heating elements having measured temperatures below the set value, and

providing top- and bottom-heating convection effects only to those convection zones in radiation heating elements to which power is being increased are located.

11. An arrangement for heating glass panels in a tempering furnace, comprising:

a tempering furnace;

a tempering station in communication with the tempering furnace;

5 rollers defining a conveyor for carrying glass panels along a path of travel into the tempering furnace and the tempering station;

the tempering furnace including bottom radiation heating elements below and top radiation heating elements above the path of travel, and bottom convection heating elements below and top convection heating elements above the path of travel arranged to supply convection air to the tempering furnace, the convection heating elements below the path of travel extending along a length of the tempering furnace and defining convection heating zones disposed side by side in a lateral direction of the tempering furnace.

12. The arrangement as set forth in claim 11, wherein the bottom convection heating elements include regulators adapted to adjust at least one of volume flow, temperature, and jet duration of convection air in the bottom convection heating elements in order to vary convection heating effects in the convection heating zones.

13. The arrangement as set forth in claim 11, wherein the tempering furnace includes a control unit for varying convection heating effects in the convection heating zones.

14. The arrangement as set forth in claim 13, wherein the top radiation heating elements include temperature sensors for measuring temperatures of the top radiation heating elements and the control unit adjusts at least one of volume flow, temperature, and jet duration of convection air in the bottom convection heating elements in order to vary convection heating effects in the convection heating zones in response to signals from the temperature sensors.

15. The arrangement as set forth in claim 11, wherein the bottom heating convection elements include heating ducts in which convection air is warmed up prior to release into the tempering furnace, the heating ducts extending along a length of the tempering furnace.

16. The arrangement as set forth in claim 15, wherein the heating ducts extend along at least half of the furnace length.

5 17. The arrangement as set forth in claim 11, wherein the bottom radiation heating elements include a casing defining a jet pipe for convection air.

10 18. The arrangement as set forth in claim 11, wherein the bottom heating convection elements and the top heating convection elements are arranged so that jets of convection air therefrom are adapted to hit a glass panel at points that are displaced relative to each other in a lateral direction of the furnace.